

Suitability of Sandy Beach Foreshores as Habitat: Examples from Two Estuaries

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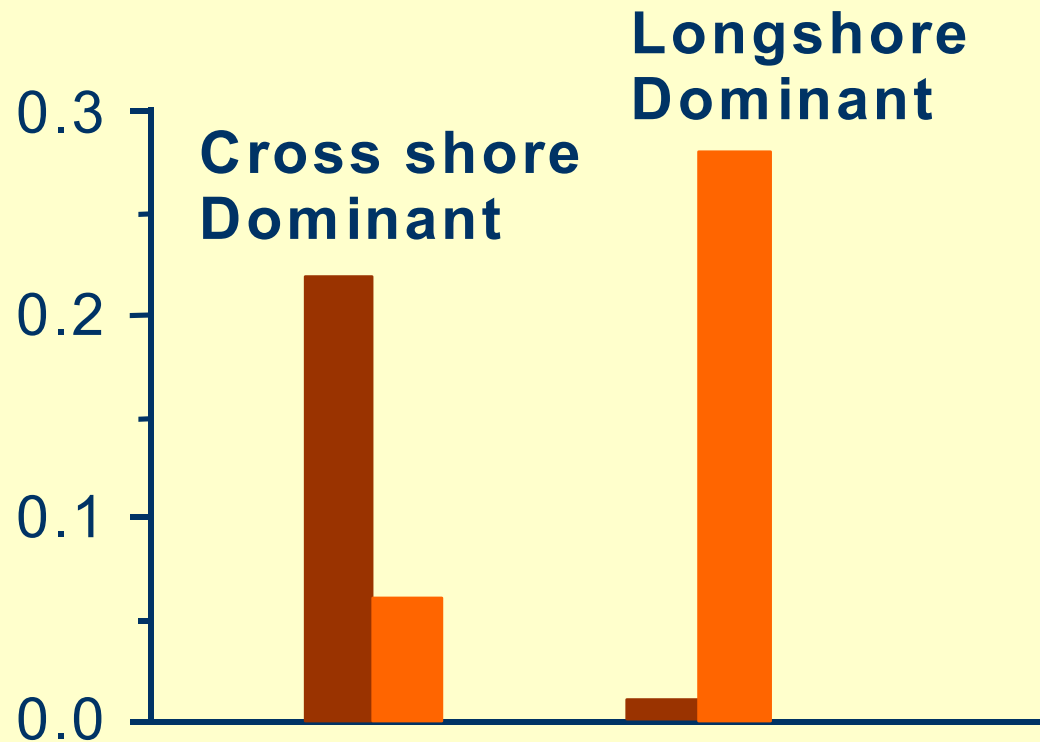
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University, NJ

D.R. Smith, US Geological Survey, Leetown Science Center, WV

V.L. Spalding, ESRI, Inc., CA



**Mean Velocity
(m s⁻¹)**



Wind speed (m s⁻¹)

8.5

9.8

Wind dir. (az)

067

023

Wave height (m)

0.3

0.3

Water depth (MLW) (m)

1.4

1.4

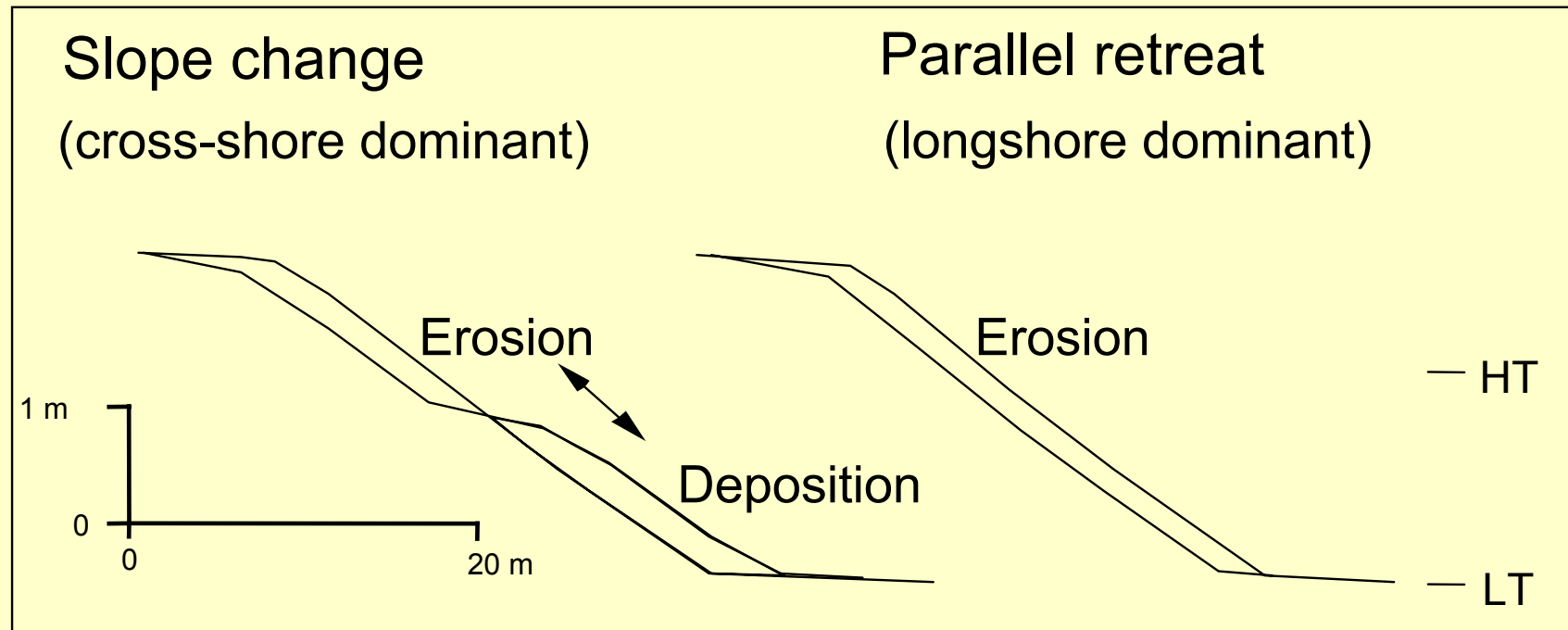


Cross shore velocity



Longshore velocity

SANDY BEACH CHANGE IN ESTUARIES







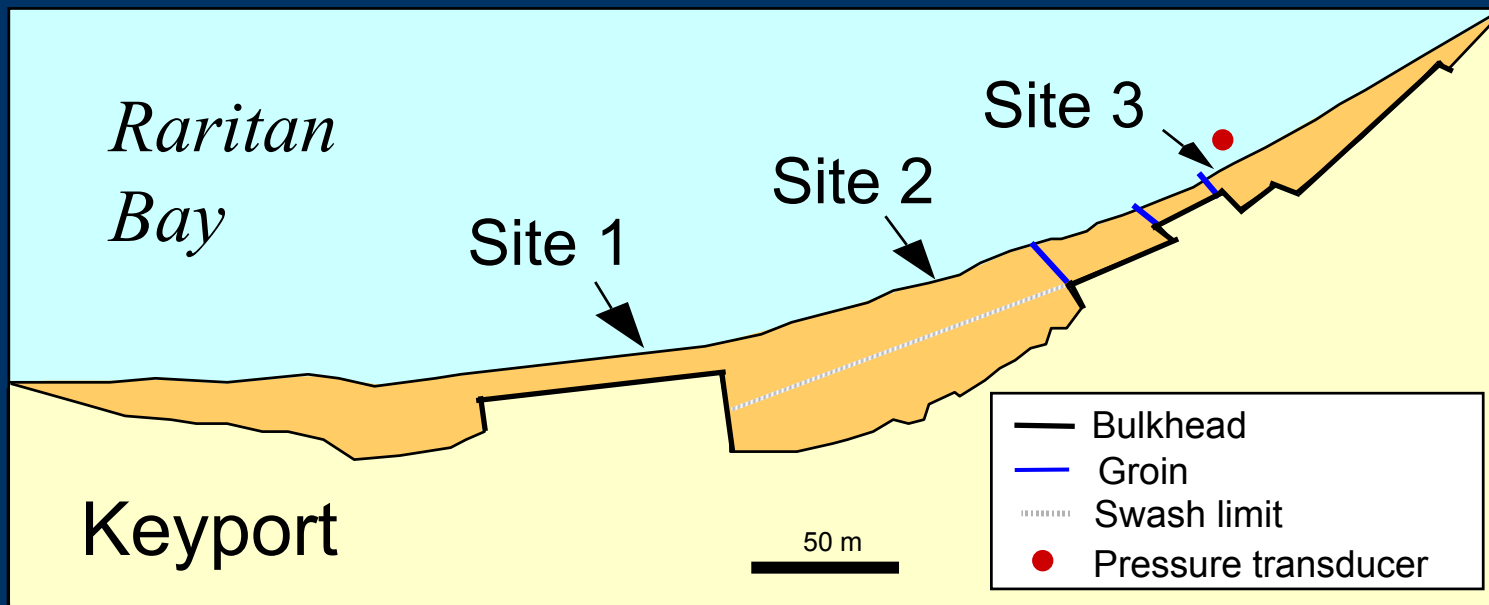
RESEARCH QUESTIONS

Effect of shore protection practices on sandy beach ecology?

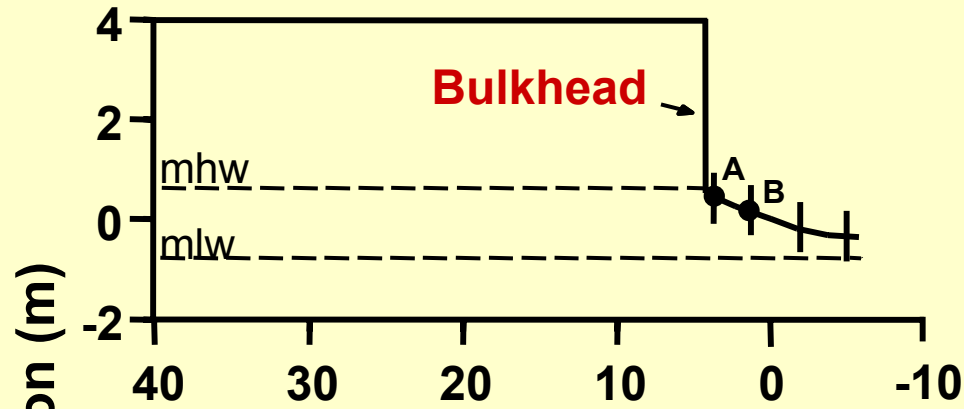
Abundance of meiofauna on foreshores fronting bulkheads

Influence of waves and horseshoe crab spawning on egg and sediment mobility?

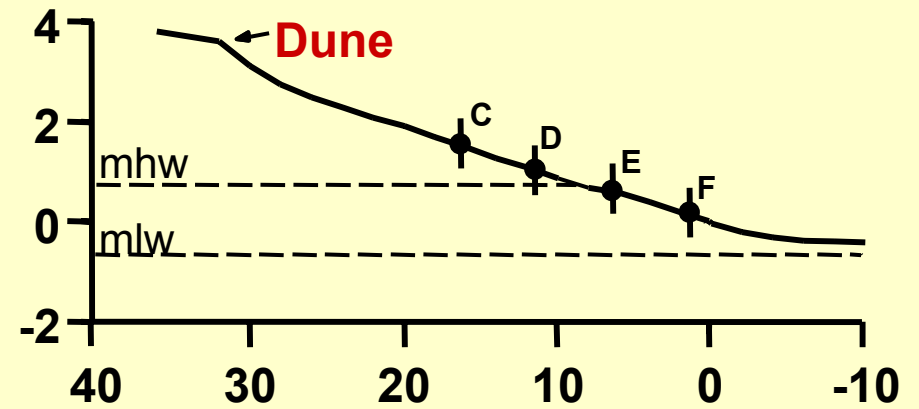
Contribution of waves and bioturbation to sediment mobilization



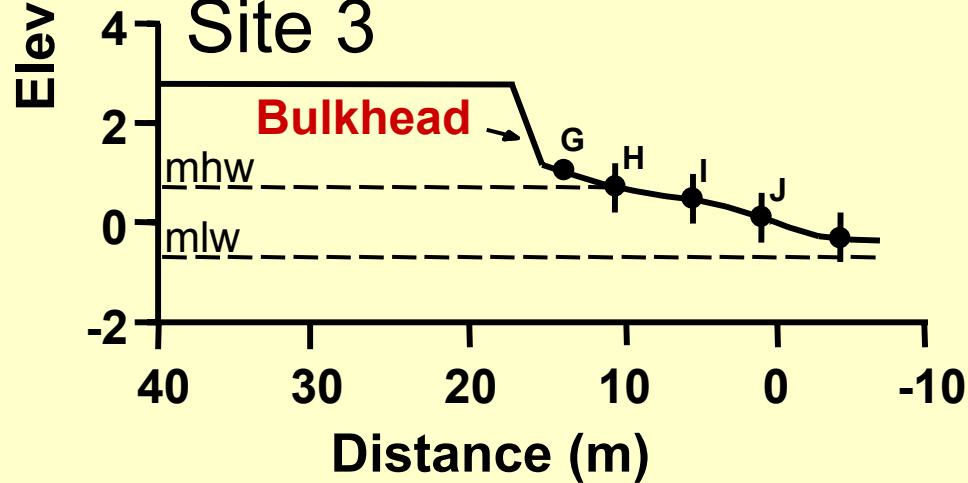
Site 1



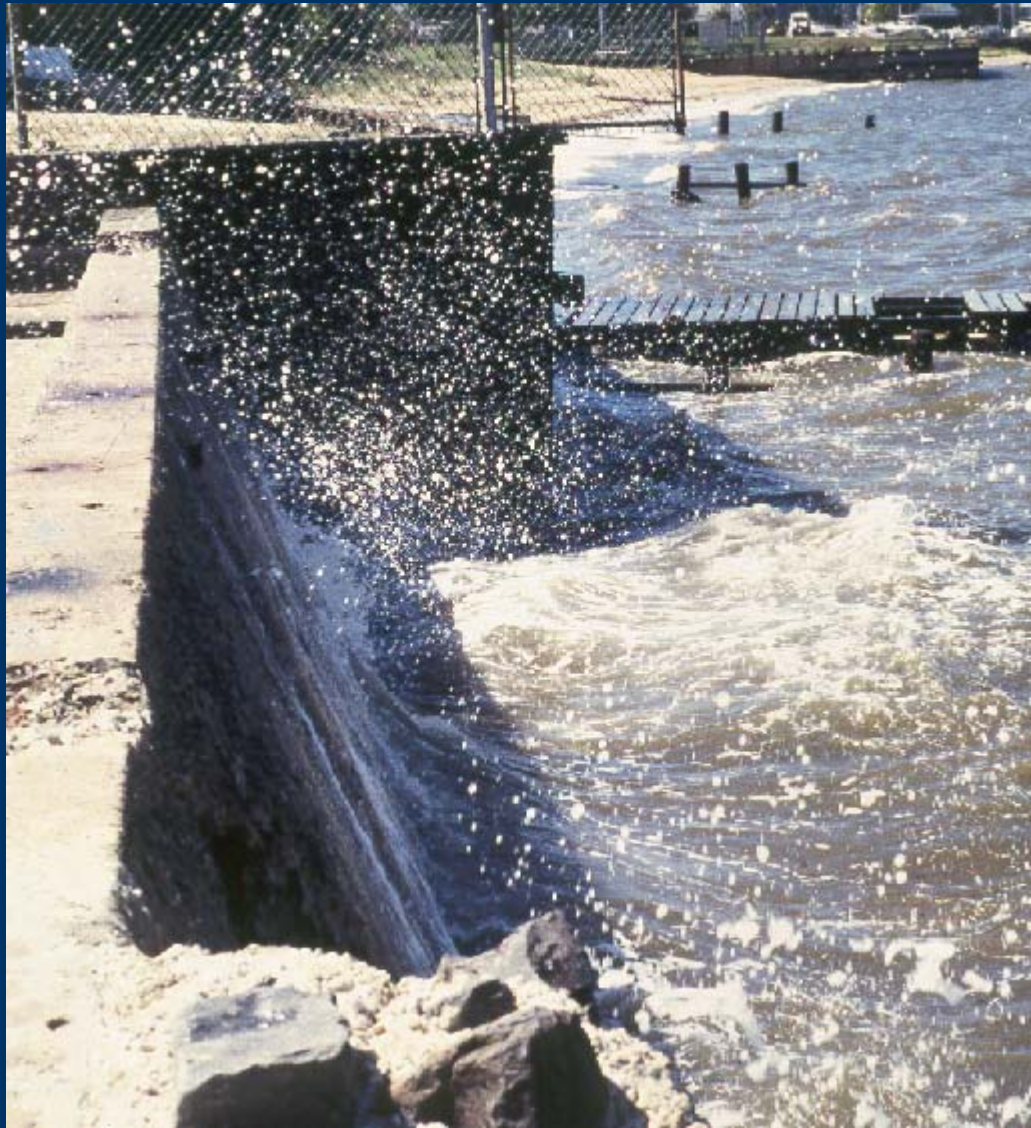
Site 2



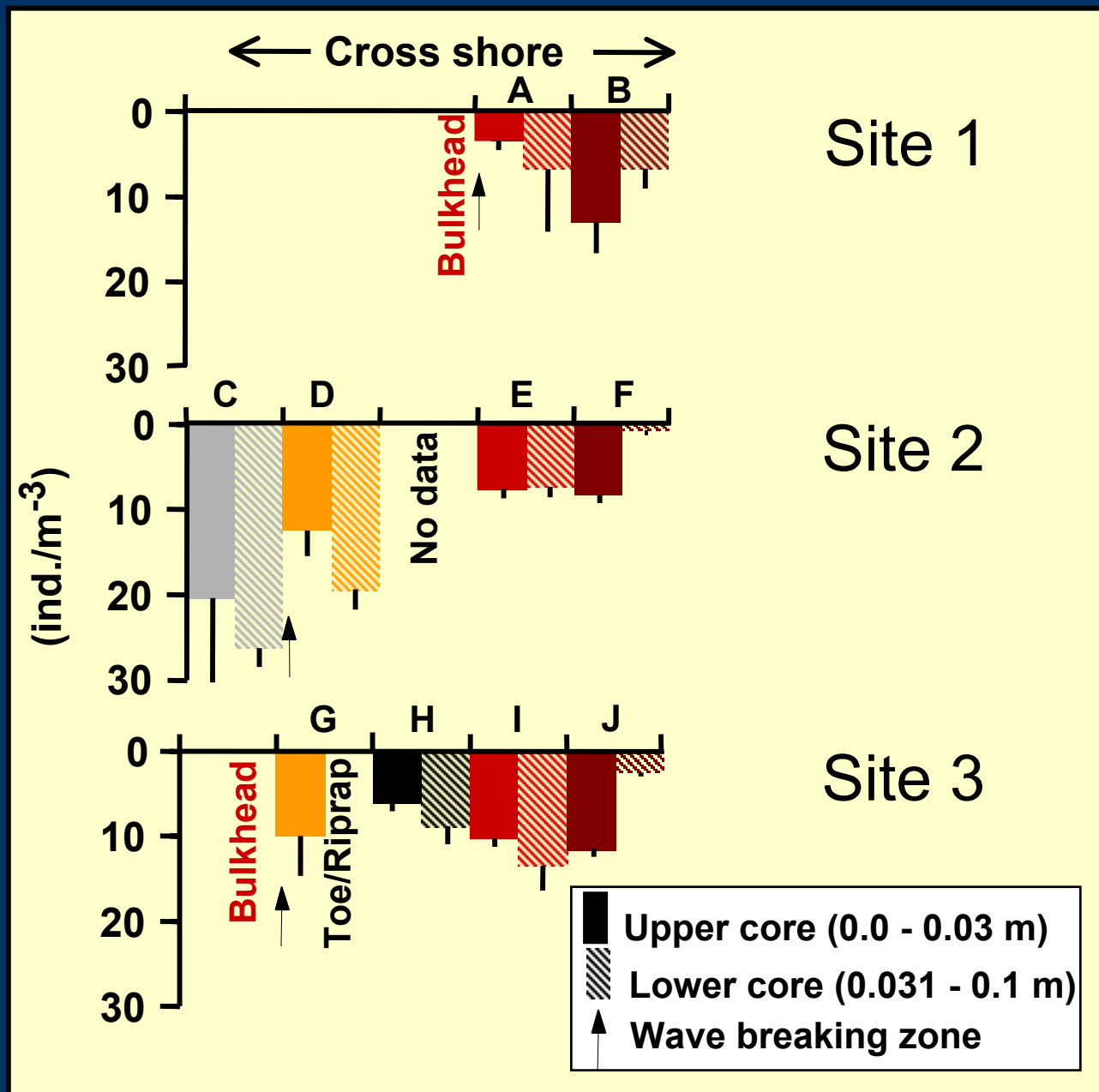
Site 3



- Meiofauna and sediment sampling station
- | Depth of disturbance rod



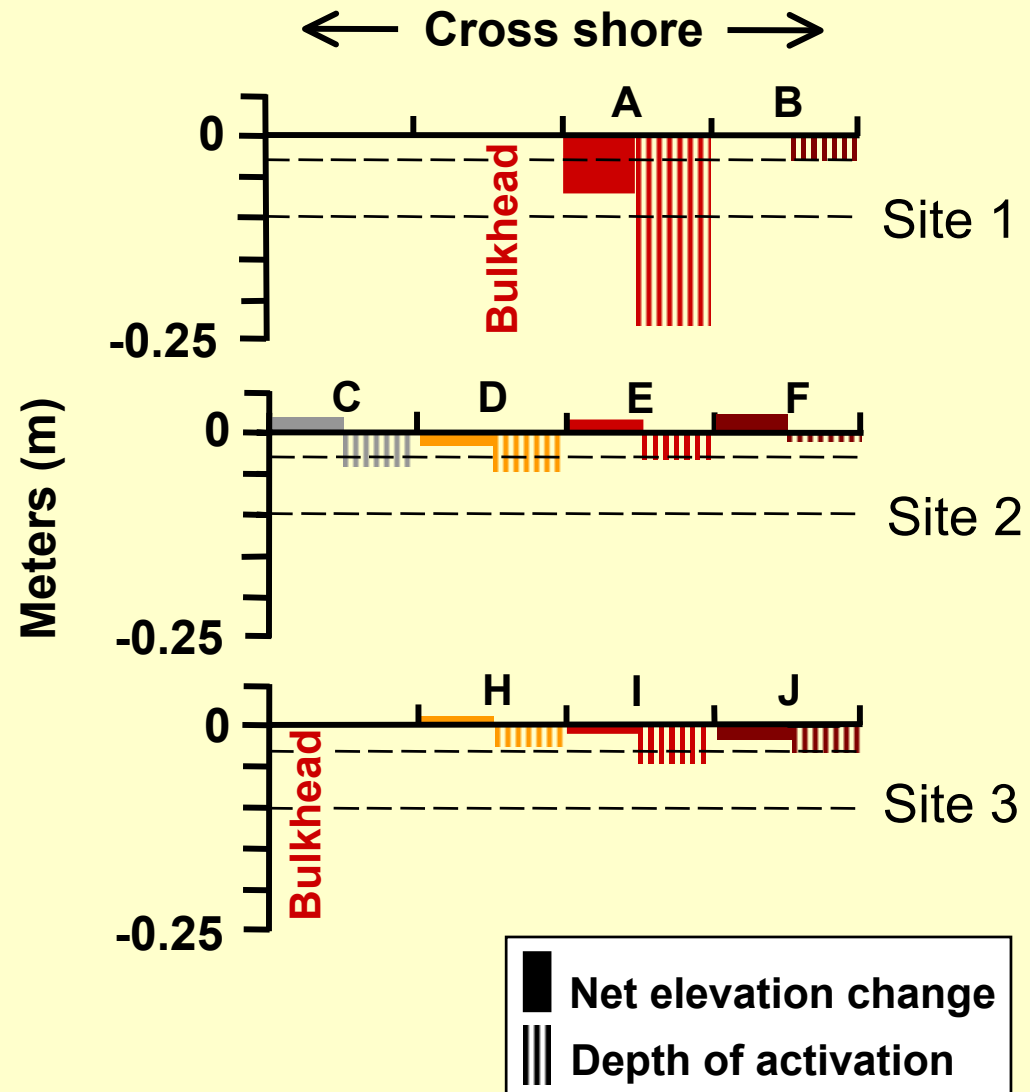
AVERAGE MEIOFAUNAL DENSITY



NET
ELEVATION
CHANGE

AND

DEPTH OF
SEDIMENT
ACTIVATION

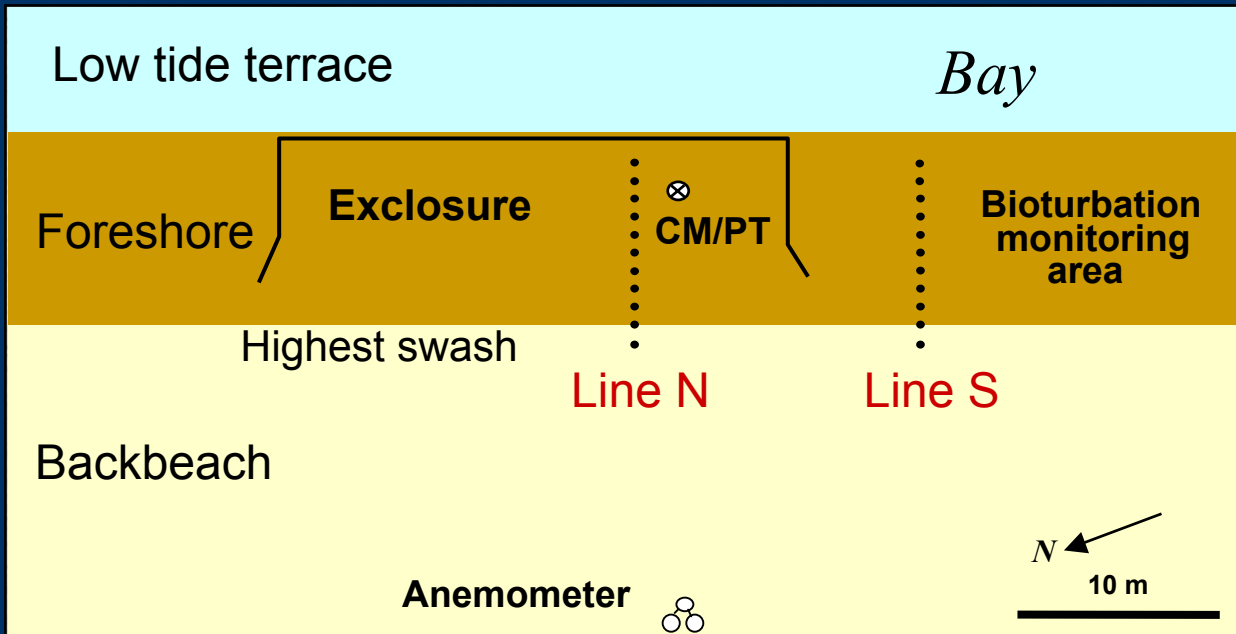
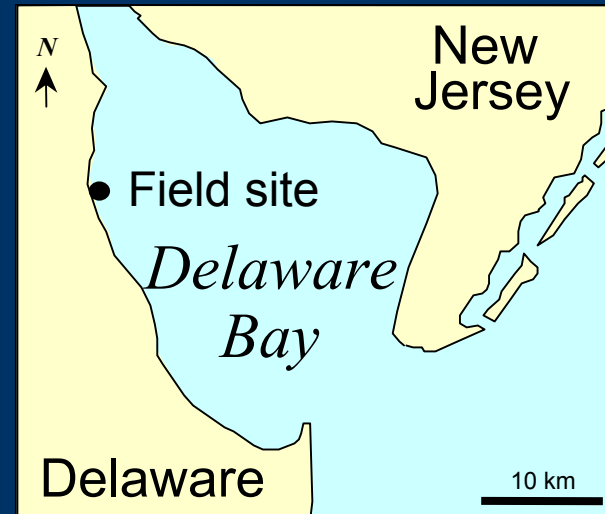


CONCLUSIONS

Elimination of the upper foreshore where abundance is greatest

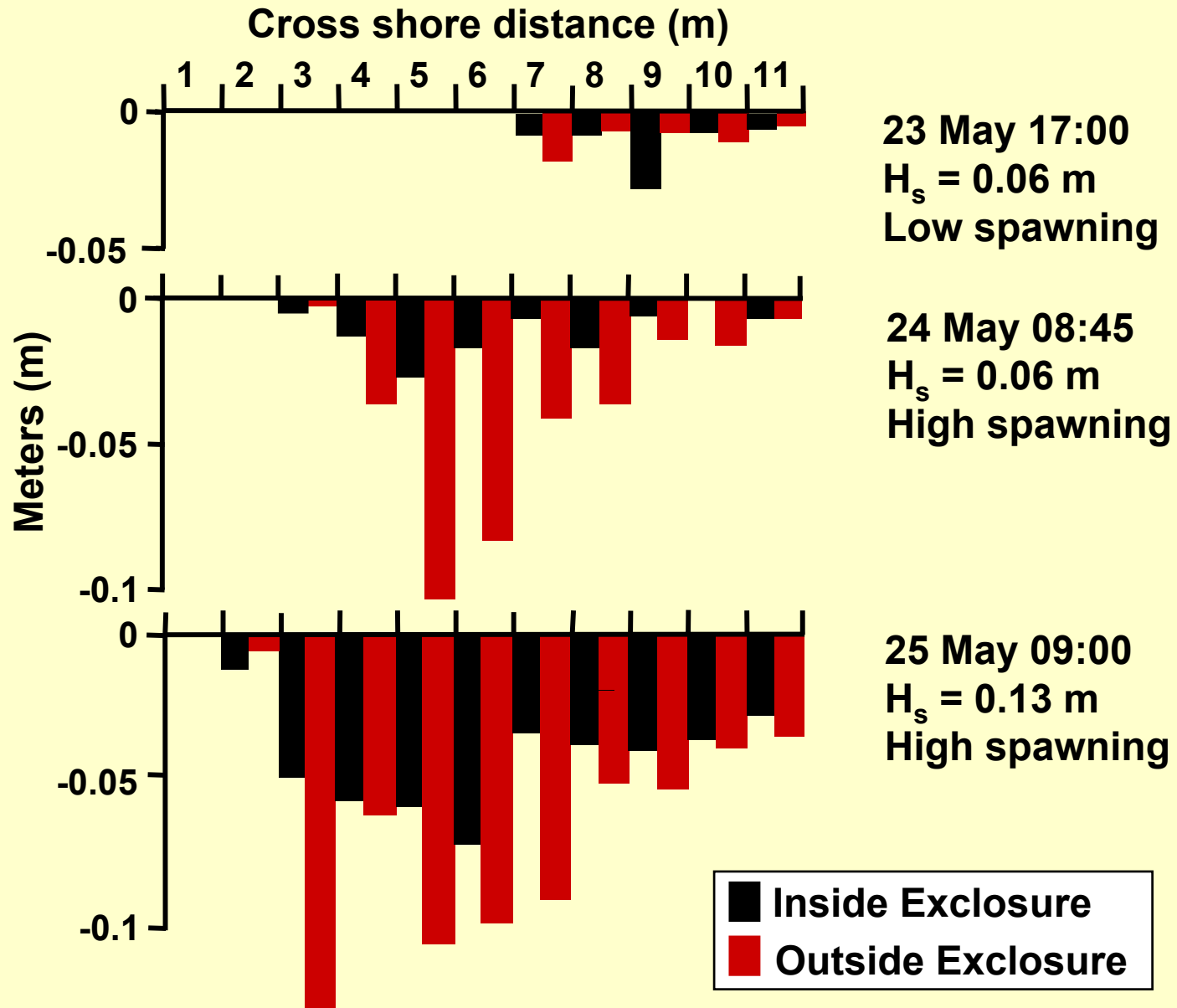
Decrease in abundance where structure intersects low on the profile

Sea level rise???





SEDIMENT ACTIVATION



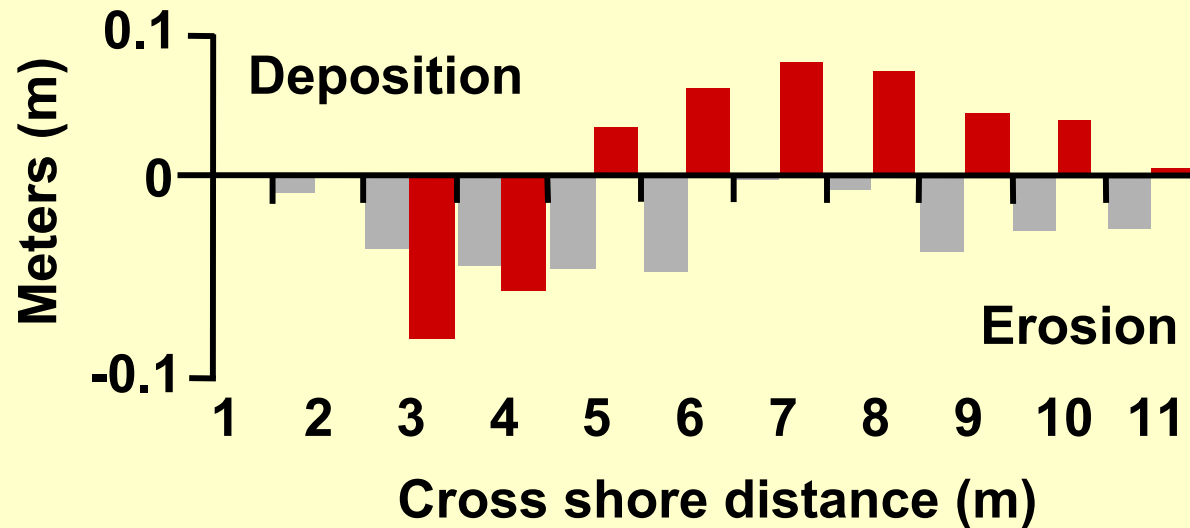
INSIDE
EXCLOSURE
(low spawning)
3.9% > 4.0 mm



OUTSIDE
EXCLOSURE
(high spawning)
51.9% > 4.0 mm



NET ELEVATION CHANGE



CONCLUSIONS

Activation by horseshoe crabs can exceed wave activation during very low wave heights (0.06 m) when spawning is high

Waves and bioturbation can result in activation depths of 0.13 m during wave heights of 0.13 m

Crab spawning results in cross shore sediment exchange and changes in surface sediments

Bulkheads and nourishment???